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EXAMINER
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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

**MAILED**

SEP 04 2007

Technology Center 2100

Application Number: 10/675,505  
Filing Date: September 30, 2003  
Appellant(s): PANDE ET AL.

VERITAS Operating Corporation  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 5/16/2007 appealing from the Office  
action mailed 9/18/2006

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

2005/0278393	Huras et al.	12/15/2005
6,615,223	Shih et al.	9/2/2003
6,578,041	Lomet	6/10/2003

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8, 11, 13, and 14-24 are rejected under 35 USC 103(a) as being obvious over Huras (U.S. 2005/0278393 A1), in view of Shih et al. (U.S. 6,615,223 B1) (hereinafter Shih).

Regarding claims 1 and 21, Huras teaches determining that a change occurred to data in a first region of a first plurality of regions (table spaces 1-4 of figure 2) of a first volume (drawing reference 208 paragraph 0036, lines 1-3). Huras further teaches processing the log files in a discriminatory manner, so that only log files corresponding to a certain region of a first volume are replayed during backup (paragraph 0036, line 7; see also paragraph 0041); such that a change could be recorded but not replayed as long as a region is not recovery, which is the equivalent of without including a first region in a set of regions designated for processing. Wherein the change resulted from a restore operation ([0020,0035]; restoring a backup version of the table space); and in response to determining that the change occurred (log files 303 describe changes made

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to the database objects 210; [0041-0042]), updating information identifying a set of regions designated for replication (log files applying to one or more tablespaces 1, 2, 3, 4, collect information, such as tracking information, made to various tablespaces [0041]; furthermore, history records 400 are updated as the selected tablespaces 1, 2, 3, 4 are modified [0054]; also figures 3-4);

Huras does not explicitly disclose where the processing is replication to a second volume and wherein subsequent to the updating the information, the first region is included in the set of regions designated for replication to the second volume. In the same field of endeavor (database backup), Shih discloses replication of logged changes from one volume to a second volume (column 4, lines 27-31, et seq.). Furthermore, Shih teaches any data changes at a first replication site are replicated to other replication sites (col. 4 line 23-36).

Accordingly, it would have been obvious to a person of ordinary skill in the art to have incorporated Shih's teachings of replication from one volume to another with Huras' teachings of determination that a change occurred and discriminatory replay of log files based on the associated region of a volume to obtain a determination that a change occurred to a region of data in a volume without designating that region for replication to a second volume. Shih suggests a need for more efficiency in replication systems in column 3, lines 36-38. Huras suggests mirroring an organization's data structures efficiently in paragraph 0006.

Regarding claim 2, Huras does not explicitly disclose wherein the change occurred to the data in the first region as a result of restoring at least one region of the first plurality of regions from a second set of regions of a third volume. In the same field of endeavor (database backup), Shih discloses the use of replication of data to make a plurality of backup copies that can be used to restore a database in the event of a failure in lines 18-21 of column 1. Shih goes on to disclose in column 4, lines 27-31 that any data changes at a first replication site are replicated to a plurality of databases. The motivation for combining the teachings of Shih with the teachings of Huras is the same as applied in the rejection of claim 1.

Regarding claim 3, wherein the third volume is a snapshot of the first volume at one point in time (Huras, paragraph 0035).

Regarding claim 4, wherein a second region of the first plurality of regions is included in the set of regions designated for replication when a respective change to the second region is added to a log comprising at least one change to at least one region, wherein each of the at least one region in the log is designated for replication to the second volume, Huras teaches logging of changes to a second plurality of regions in paragraph 0036; see also paragraph 0042. In the same field of endeavor (database backup), Shih discloses replication of logged changes from one volume to a second volume (column 4, lines 27-31, et seq.). The motivation for combining the teachings of Shih with the teachings of Huras is the same as applied in the rejection of claim 1.

Regarding claim 5, wherein a third region of the first plurality of regions is included in the set of regions designated for replication when a second respective change occurs to the third region, and the second respective change to the third region cannot be added to the log. Huras teaches logging of changes to a plurality of regions in paragraph 0036; see also paragraph 0042, which is the equivalent of wherein a third region of the first plurality of regions is logged. Huras teaches in paragraph 0042, line 9 wherein a change cannot be added to a log. In the same field of endeavor (database backup), Shih teaches replication of logged changes from one volume to a second volume column 4, lines 27-31, et seq.). The motivation for combining the teachings of Shih with the teachings of Huras is the same as applied in the rejection of claim 1.

Regarding claim 6, this claim has been cancelled.

Regarding claim 7, Huras does not explicitly disclose replicating each region in the set of regions designated for replication from the first volume to the second volume. Shih teaches replication of logged changes from one volume to a second volume (column 4, lines 27-31, et seq.). The motivation for combining the teachings of Shih with the teachings of Huras is the same as applied in the rejection of claim 1.

Regarding claim 8, Huras discloses selective processing of log files containing changes to backup versions of log files, namely processing of log files containing

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changes corresponding to a region in a volume (Huras, paragraph 0032; see also paragraph 0036). In Huras only select regions are processed. Huras does not disclose replication of the selected regions. Shih discloses the equivalent by disclosing replication of changes (Shih, column 4, lines 27-31, et seq.). The motivation for combining the teachings of Shih with the teachings of Huras is the same as applied in the rejection of claim 1.

Regarding claim 11, wherein the data are accessible during the restoring (Huras, paragraphs 0069 and 0070). Huras discloses in paragraphs 0.069 and 0070 recovery of selected tablespaces, and in these same paragraphs discloses how the method obtains locks for only those tablespaces, thus data in the database are accessible for update during the restore process.

Regarding claim 13, wherein a second region of the first plurality of regions is included in the set of regions designated for replication when a second respective change occurs to the second region, and the second respective change cannot be added to a log of changes to at least one region, wherein each region of the at least one region in the log is included in the set of regions designated for replication. Huras teaches logging of changes to a plurality of regions in paragraph 0036; see also paragraph 0042, which is the equivalent of wherein a second region of the first plurality of regions is logged. Huras teaches in paragraph 0042, line 9 wherein a change cannot be added to a log. In the same field of endeavor (database backup), Shih teaches



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replication of logged changes from one volume to a second volume (column 4, lines 27-31, et seq.). The motivation for combining the teachings of Shih with the teachings of Huras is the same as applied in the rejection of claim 1.

Claims 9, 10, and 12 are rejected under 35 USC 103(a) as being obvious over Huras (U.S. 2005/0278393 A1), in view of Shih et al. (U.S. 6,615,223 B1) (hereinafter Shih) as applied to the rejection of claim 11 in further view of Lomet (U.S. 6,578,041 B1).

Regarding claim 9, Huras and Shih disclose restore of select regions of a database but do not explicitly disclose wherein the replicating continues during the restoring. In the same field of endeavor (database backups), Lomet teaches online replication of a database that occurs in conjunction with normal database activity (column 14 lines 1-3).

Accordingly, it would have been obvious to a person of ordinary skill in the art to have incorporated Lomet's teachings of online replication of a database with Huras and Shih's teachings of restore of select regions of a database to obtain a database wherein replication continues during restoring. Lomet suggests a need in column 5, lines 59-62 where a description is provided of conventional databases lacking on-line backup capability. Shih suggests a need for more efficiency in replication systems in column 3, lines 36-38.

Regarding claim 10, Huras and Shih do not explicitly disclose wherein the data are accessible during the replicating. In the same field of endeavor (database backups), Lomet teaches wherein the data are accessible during the replicating. (Lomet, column 3, lines 26-27). Accordingly, it would have been obvious to a person of ordinary skill in the art to have incorporated Lomet's teachings of online backups with Huras and Shih's teachings of replication of regions from one volume to another volume for the purpose of improved availability to data. Lomet suggests a need in column 5, lines 59-62 where a description is provided of conventional databases lacking on-line backup capability. Huras suggests mirroring an organization's data structures efficiently in paragraph 0006.

Regarding claim 12, this claim has been cancelled.

Claims 14-16 are essentially the same as claims 6-8 except that they set forth the claimed invention as a system rather than a method and are rejected for the same reason as applied hereinabove.

Claims 17-20 are essentially the same as claims 1, 14, 15, and 16 respectively except that they set forth the claimed invention as a system rather than a method and are rejected for the same reason as applied hereinabove.

Claims 17-20 are essentially the same as claims 1, 14, 15, and 16 respectively except that they set forth the claimed invention as a computer readable medium rather than a method and are rejected for the same reason as applied hereinabove.

#### **(10) Response to Argument**

Appellant's arguments in the appeal brief ("brief" herein) filed 5/16/2007 have been fully considered but they are not persuasive.

On page 5 of the brief, Appellant first argues that the cited art tracks transactions affecting a database, not changes to a volume so that "determining that a change occurred to data in a first region of a first plurality of regions of a first volume" is not taught or suggested. The Examiner disagrees given the following:

As cited above, the Huras reference teaches various tablespaces in a database. As interpreted by the Examiner, tablespaces are construed as regions and a database equates to the claimed volume. The Appellant contends that a database is clearly not a volume (brief at page 5). On the contrary, the Examiner believes a volume and database can be the same. For instance, as gleaned from the Appellant's specification (paragraph 0005), a logical storage volume is formed of a group of disks. The Appellant further states a storage volume to be interchangeable with "storage area." Broadly interpreted, the database of Huras is in effect a "storage area"; that is, it is basically an area of storage containing data. Furthermore, Huras similarly teaches [a plurality of] disks containing database 208 (paragraph 0073, Huras). Therefore, a database of Huras can be clearly mapped to the volume of the present application.

Moreover, since a database equates to a volume, then the tablespaces of the database can clearly equate to regions of a volume. Specifically, Huras designates in an exemplary embodiment four tablespaces (figure 2) to represent regions of a database (i.e. volume). Furthermore, Huras describes log files (paragraph 0041) that correspond to changes made to tablespaces and thus determines a change in a first region of a first plurality of regions. For example, Huras teaches a transaction #2 modifying (i.e. changing) tablespaces 2, 3, and 4 is tracked with associated log file #10, log file #11, and log file #12 (paragraph 0043).

Appellant then argues (page 6) that the cited prior art tracks transactions, not changes resulting from a restore operation so that “the change resulted from a restore operation” is not taught or suggested. The Examiner disagrees with this assertion given the following:

In paragraph 0035, Huras first mentions recovering tablespaces by restoring a backup version of the tablespace. Also, Huras mentions that tablespaces are restored using a recovery process (i.e. by applying, or “forward rolling” selected log files; paragraphs 0053 and the last line of 0069). Further, Huras teaches using log files to recover (i.e. restore) one or more tablespaces (paragraph 0041). As stated by Huras (paragraph 0041), “During an operation for recovering selected tablespaces 1, 2, 3, 4, the log files 303 are selectively read...with those records 307 processed that apply to the tablespace 1, 2, 3, 4, being recovered.” Therefore, Huras teaches using log files to restore tablespaces (last 3 lines of paragraph 0054) to teach a restore operation.

To teach determining changes resulting from a restore operation, Huras uses a tablespace change history table (fig. 4) within the database system. Huras states (paragraph 0046) that the tablespace change history table records the table spaces 1, 2, 3, 4, that are modified by the log records. With the above teaching in mind, the tablespace change history table records the changes that were made by the log files (i.e. records the changes from the restore process of using the log files). Huras also teaches (paragraph 0046) that the tablespace modified (drawing reference 406) field contains the list of tablespace IDs that are modified by the log records. Here, again, the tablespace change history table records modifications made from log files (in which the log files were used in a restoring operation).

Finally, Appellant argues (page 8-9 of the brief) that the cited art tracks transactions for replay, not changes, which resulted from a restore operation, for use in replication so that "in response to determining that the change occurred, updating information identifying a set of regions designated for replication to a second volume, wherein subsequent to the updating the information, the first region is included in the set of regions designated for replication to the second volume" is not taught or suggested.

The Examiner disagrees because as described in response to the argument above, Huras teaches using a tablespace change history table that records changes made by log files in a recovery process used to restore the database (Huras, paragraph 0046).

The Appellant then argues (page 9, second full paragraph) that neither reference suggests that regions of a volume changed by a restore operation should be designated for replication. The Examiner disagrees given the following:

The Shih reference, as used in the 35 USC 103(a) rejection above (p. 3 in this document) was employed to teach this limitation.

Shih teaches (col. 4 line 27-31) data changes at a first replication site are replicated to other replication sites. As well known in the art in data replication, when changes are detected in one site, [in response] those changes have to be replicated to another site (otherwise known as synchronous replication). Shih provides support for synchronous replication (col. 1 line 23-33). That is, Shih teaches that synchronous replication is considered a "real time" data replication methodology, and thereby teaching "*in response* to determining that the change occurred" recited in claim 1.

Furthermore Shih teaches (again in col. 1 line 27-32) for example, if a change in a first table at a first replication site A, that change must be replicated to the corresponding tables at all other replication sites. As the change is reflected to corresponding tables at different sites, those sites are clearly designated for replication. Therefore, Shih plainly teaches the claimed in response to determining that the change occurred (i.e. synchronous replication) and a region of a volume that is modified by a change caused by a restore operation should be designated for replication (i.e. changes in one site are correspondingly replicated, or designated to those tables at another replication site).

Lastly, the Appellant argues (lines 5-8 of the second full paragraph, p. 9) that the cited art also fails to suggest, "updating information identifying a set of regions designated for replication" to designate a region changed by a restore operation. The Examiner disagrees given the following:

As seen above in the rejection of claim 1, Shih uses change records in a change table to replicate changes from one site to the next. In detail, Shih further teaches and describes the change records (col. 5 line 21-35) contain change information (i.e. information identifying a set of regions designated for replication to a second volume) directed towards specific data to determine what data items (i.e. tables) are being changed. Therefore, Shih clearly suggests updating the information (of a change record table) because inherently, as changes are made at one site, the change record table would be updated to record and add those changes so they can be replicated to another site. Shih further suggests updating the change record table (i.e. information identifying a set of regions designated for replication) when they mention that the change records within the table may have different versions (col. 5 line 32). Specifically, newer, or different versions of a change record (which identifies regions designated for replication) would suggest the updating of that information.

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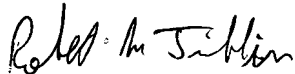
**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Robert M. Timblin



Patent Examiner AU 2167

28 August 2007

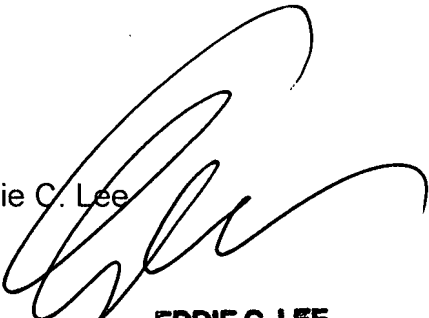
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